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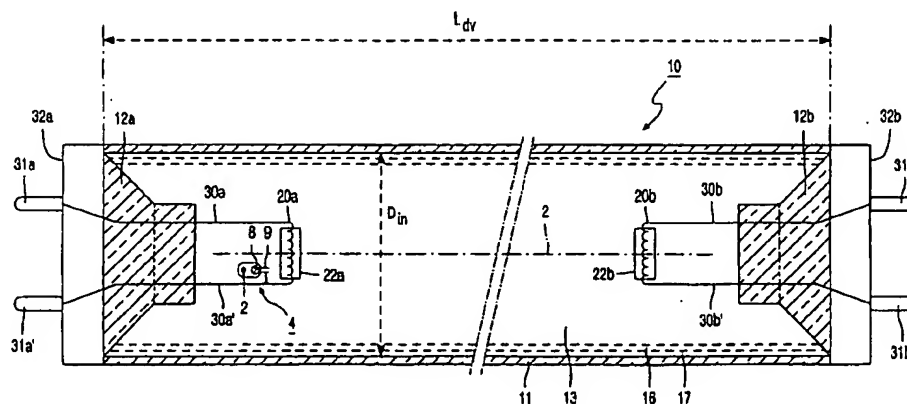
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#### Declaration under Rule 4.17:

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[Continued on next page]

(54) Title: **LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP**



(57) Abstract: Low-pressure mercury vapor discharge lamp comprises a light-transmitting discharge vessel (10) enclosing, in a gastight manner, a discharge space (13) provided with a filling of mercury and a rare gas. The discharge vessel comprises discharge means (20a; 20b) for maintaining a discharge in the discharge space. The discharge vessel is provided with a container comprising an amalgam (2). The container is provided with releasing means (4) for the controlled release of mercury vapor from the amalgam. The releasing means is open during lamp operation and is substantially closed when, during lamp operation, the temperature of the amalgam becomes higher than a pre-determined temperature. Preferably, the pre-determined temperature corresponds to a temperature of a range of temperatures at which the mercury-vapor pressure above the amalgam is relatively stable.



BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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# INTERNATIONAL SEARCH REPORT

International Application No  
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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01J61/28 H01J61/72

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 062 141 A (WESTINGHOUSE ELECTRIC CORPORATION) 15 March 1967 (1967-03-15) page 1, lines 12-18 page 2, lines 20-28, 70-75 page 3, lines 20-98 page 6, lines 43-111 figures 1, 2, 4, 7, 17-20, 26	1, 8
A	PATENT ABSTRACTS OF JAPAN vol. 011, no. 077 (E-487), 7 March 1987 (1987-03-07) & JP 61 232548 A (MATSUSHITA ELECTRIC IND CO LTD), 16 October 1986 (1986-10-16) abstract figures 3, 4	4
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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 205 (E-420), 17 July 1986 (1986-07-17) & JP 61 047056 A (TOSHIBA CORP), 7 March 1986 (1986-03-07) abstract figures 1,3	1,4,8
A	----- US 6 456 004 B1 (JOHNSON WAYNE D ET AL) 24 September 2002 (2002-09-24) cited in the application abstract column 2, lines 13-28 figures 2-4	1
A	----- WO 00/51161 A (KONINKLIJKE PHILIPS ELECTRONICS N.V; PHILIPS CORPORATE INTELLECTUAL PR) 31 August 2000 (2000-08-31) page 1, lines 23-26 page 4, lines 23-26 page 5, lines 27-30 page 7, lines 23-26 page 8, lines 11-13 figures 4a-c,5	1,5-7
A	----- EP 1 047 110 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD) 25 October 2000 (2000-10-25) figure 1 column 5, lines 17-33 -----	1,9

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International Application No  
**PCT/IB2004/050904**

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 1062141	A	15-03-1967	BE 666597 A	03-11-1965
			DE 1246120 B	03-08-1967
			DE 1290257 B	06-03-1969
			DE 1287215 B	16-01-1969
			DE 1290631 B	13-03-1969
			ES 335661 A2	16-02-1968
			GB 1137010 A	18-12-1968
			GB 1137090 A	18-12-1968
			GB 1175411 A	23-12-1969
			NL 6507948 A	10-01-1966
			NL 6700706 A	04-08-1967
			NL 6700762 A	04-08-1967
			NL 6700890 A	04-08-1967
			SE 328054 B	07-09-1970
			SE 328055 B	07-09-1970
			SE 328056 B	07-09-1970
			US 3422299 A	14-01-1969
			US 3534212 A	13-10-1970
			US 3619697 A	09-11-1971
			-----	
JP 61232548	A	16-10-1986	NONE	
-----				
JP 61047056	A	07-03-1986	NONE	
-----				
US 6456004	B1	24-09-2002	NONE	
-----				
WO 0051161	A	31-08-2000	CN 1302449 A	04-07-2001
			JP 2002538583 A	12-11-2002
			TW 548681 B	21-08-2003
			US 6404122 B1	11-06-2002
-----				
EP 1047110	A	25-10-2000	CN 1271960 A	01-11-2000
			US 6597105 B1	22-07-2003
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